CONTAINS NO CBI

EPA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comprehensive Assessment Information Rule

REPORTING FORM

When completed, send this form to:	For Agency Use Only:
Document Processing Center Office of Toxic Substances, TS-790 U.S. Environmental Protection Agency 401 M Street, SW Washington, DC 20460 Attention: CAIR Reporting Office	Date of Receipt: _____ Document Control Number: _____ Docket Number: _____

EPA Form 7710-52

SECTION 1 GENERAL MANUFACTURER, IMPORTER, AND PROCESSOR INFORMATION

PART A GENERAL REPORTING INFORMATION

1.01 This Comprehensive Assessment Information Rule (CAIR) Reporting Form has been completed in response to the Federal Register Notice of..... [1][2] [2][2] [8][8]
mo. day year

CBI

[ ] a. If a Chemical Abstracts Service Number (CAS No.) is provided in the Federal Register, list the CAS No. ..... [0][2][6][4][7][1]-[6][2]-[5]

b. If a chemical substance CAS No. is not provided in the Federal Register, list either (i) the chemical name, (ii) the mixture name, or (iii) the trade name of the chemical substance as provided in the Federal Register.

(i) Chemical name as listed in the rule ..... NA

(ii) Name of mixture as listed in the rule .... _____

(iii) Trade name as listed in the rule ..... _____

c. If a chemical category is provided in the Federal Register, report the name of the category as listed in the rule, the chemical substance CAS No. you are reporting on which falls under the listed category, and the chemical name of the substance you are reporting on which falls under the listed category.

Name of category as listed in the rule ..... NA

CAS No. of chemical substance ..... [ ][ ][ ][ ][ ][ ]-[ ][ ]-[ ]

Name of chemical substance ..... _____

1.02 Identify your reporting status under CAIR by circling the appropriate response(s).

CBI

Manufacturer 1

[ ] Importer 2

Processor ..... (3)

X/P manufacturer reporting for customer who is a processor 4

X/P processor reporting for customer who is a processor 5

[ ] Mark (X) this box if you attach a continuation sheet.

1.03 Does the substance you are reporting on have an "x/p" designation associated with it in the above-listed Federal Register Notice?

CBI

[ ]

Yes ..... [X] Go to question 1.04

No ..... [ ] Go to question 1.05

1.04 a. Do you manufacture, import, or process the listed substance and distribute it under a trade name(s) different than that listed in the Federal Register Notice? Circle the appropriate response.

CBI

[ ]

Yes 1

No ..... (2)

b. Check the appropriate box below:

[ ] You have chosen to notify your customers of their reporting obligations

Provide the trade name(s) .... _____

_____

[ ] You have chosen to report for your customers

[ ] You have submitted the trade name(s) to EPA one day after the effective date of the rule in the Federal Register Notice under which you are reporting.

1.05 If you buy a trade name product and are reporting because you were notified of your reporting requirements by your trade name supplier, provide that trade name.

CBI

[ ]

Trade name ..... NA

Is the trade name product a mixture? Circle the appropriate response.

Yes 1

No 2

1.06 Certification -- The person who is responsible for the completion of this form must sign the certification statement below:

CBI

[ ]

"I hereby certify that, to the best of my knowledge and belief, all information entered on this form is complete and accurate."

Ahmed A. Zurkiya (NAME) Ahmed Zurkiya (SIGNATURE) 6/30/89 (DATE SIGNED)

V.P. Research & Development (TITLE) (615) 698 - 8801 (TELEPHONE NO.)

[ ] Mark (X) this box if you attach a continuation sheet.

PART B CORPORATE DATA

1.09 Facility Identification

CBI Name [S][Y][N][A][I][R][ ][C][O][R][P][O][R][A][T][I][O][N][ ][ ][ ][ ][ ][ ][ ]

[ ] Address [2][0][0][3][ ][A][M][N][I][C][O][L][A][ ][H][I][G][H][W][A][Y][ ][ ][ ][ ]
Street

[C][H][A][T][T][A][N][O][O][G][A][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
City

[T][N] [3][7][4][0][6]--[ ][ ][ ][ ]
State Zip

Dun & Bradstreet Number .....[0][6]-[7][6][1]-[9][8][2][5]

EPA ID Number .....[ ][ ][ ][ ][ ][ ][ ][ ][ ]

Employer ID Number .....6[2][1][3][3][3][6][3][0]

Primary Standard Industrial Classification (SIC) Code .....[2][8][2][1]

Other SIC Code .....[ ][ ][ ][ ]

Other SIC Code .....[ ][ ][ ][ ]

1.10 Company Headquarters Identification

CBI Name [S][Y][N][A][I][R][ ][C][O][R][P][O][R][A][T][I][O][N][ ][ ][ ][ ][ ][ ][ ]

[ ] Address [2][0][0][3][ ][A][M][N][I][C][O][L][A][ ][H][I][G][H][W][A][Y][ ][ ][ ][ ]
Street

[C][H][A][T][T][A][N][O][O][G][A][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
City

[T][N] [3][7][4][0][6]--[ ][ ][ ][ ]
State Zip

Dun & Bradstreet Number .....[0][6]-[7][6][1]-[9][8][2][5]

Employer ID Number .....[ ][ ][ ][ ][ ][ ][ ][ ]

[ ] Mark (X) this box if you attach a continuation sheet.

1.11 Parent Company Identification SYNAIR

CBI Name [S][Y][N][A][I][R][ ][I][N][T][E][R][N][A][T][I][O][N][A][L][ ][C][O][R][P][ ]

[ ] Address [P][O][ ][B][O][X][ ][5][4][0][9][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
Street

[C][H][A][T][T][A][N][O][O][G][A][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
City

[T][N] [3][7][4][0][6]--[ ][ ][ ][ ]
State Zip

Dun & Bradstreet Number .....[0][6]-[7][6][1]-[9][8][2][5]

1.12 Technical Contact

CBI Name [G][E][O][R][G][E][ ][F][A][R][A][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

[ ] Title [P][R][O][C][E][S][S][ ][E][N][G][I][N][E][E][R][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Address [2][0][0][3][ ][A][M][I][C][O][L][A][ ][H][I][G][H][W][A][Y][ ][ ][ ][ ][ ]
Street

[C][H][A][T][T][A][N][O][O][G][A][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
City

[T][N] [3][7][4][0][6]--[ ][ ][ ][ ]
State Zip

Telephone Number .....[6][1][5]-[6][9][8]-[8][8][0][1]

1.13 This reporting year is from ..... [0][6] [8][7] to [0][5] [8][8]
Mo. Year Mo. Year

[ ] Mark (X) this box if you attach a continuation sheet.

1.16 For each classification listed below, state the quantity of the listed substance that was manufactured, imported, or processed at your facility during the reporting year.

CBI [ ]	Classification	Quantity (kg/yr)
	Manufactured	NA
	Imported	NA
	Processed (include quantity repackaged)	1,466,283
	Of that quantity manufactured or imported, report that quantity:	
	In storage at the beginning of the reporting year	NA
	For on-site use or processing	NA
	For direct commercial distribution (including export)	NA
	In storage at the end of the reporting year	NA
	Of that quantity processed, report that quantity:	
	In storage at the beginning of the reporting year	62091
	Processed as a reactant (chemical producer)	1,466,283
	Processed as a formulation component (mixture producer)	NA
	Processed as an article component (article producer)	NA
	Repackaged (including export)	3964
	In storage at the end of the reporting year	78,087

[ ] Mark (X) this box if you attach a continuation sheet.

PART C IDENTIFICATION OF MIXTURES

1.17 Mixture -- If the listed substance on which you are required to report is a mixture or a component of a mixture, provide the following information for each component chemical. (If the mixture composition is variable, report an average percentage of each component chemical for all formulations.)

CBI

[ ]

Component Name	Supplier Name	Average % Composition by Weight (specify precision, e.g., 45% ± 0.5%)
NA		
	Total	100%

[ ] Mark (X) this box if you attach a continuation sheet.

2.04 State the quantity of the listed substance that your facility manufactured, imported, or processed during the 3 corporate fiscal years preceding the reporting year in descending order.

CBI

[ ] Year ending ..... [0][5] Mo. [8][7] Year

Quantity manufactured ..... 0 kg

Quantity imported ..... 0 kg

Quantity processed ..... 214,130 kg

Year ending ..... [0][5] Mo. [8][6] Year

Quantity manufactured ..... 0 kg

Quantity imported ..... 0 kg

Quantity processed ..... 160,936 kg

Year ending ..... [0][5] Mo. [8][5] Year

Quantity manufactured ..... 0 kg

Quantity imported ..... 0 kg

Quantity processed ..... 125,678 kg

2.05 Specify the manner in which you manufactured the listed substance. Circle all appropriate process types.

CBI

[ ]

Continuous process ..... NA 1

Semicontinuous process ..... NA 2

Batch process ..... NA 3

[ ] Mark (X) this box if you attach a continuation sheet.

2.06 Specify the manner in which you processed the listed substance. Circle all
CBI appropriate process types.

[ ]

Continuous process 1

Semicontinuous process 2

Batch process ..... (3)

2.07 State your facility's name-plate capacity for manufacturing or processing the listed substance. (If you are a batch manufacturer or batch processor, do not answer this
CBI question.)

[ ]

Manufacturing capacity ..... NA kg/yr

Processing capacity ..... NA kg/yr

2.08 If you intend to increase or decrease the quantity of the listed substance manufactured, imported, or processed at any time after your current corporate fiscal year, estimate the increase or decrease based upon the reporting year's production
CBI volume.

[ ]

	Manufacturing Quantity (kg)	Importing Quantity (kg)	Processing Quantity (kg)
Amount of increase	NA	NA	NA
Amount of decrease	NA	NA	NA

[ ] Mark (X) this box if you attach a continuation sheet.

2.09 For the three largest volume manufacturing or processing process types involving the listed substance, specify the number of days you manufactured or processed the listed substance during the reporting year. Also specify the average number of hours per day each process type was operated. (If only one or two operations are involved, list those.)

CBI

[ ]

	Days/Year	Average Hours/Day
Process Type #1 (The process type involving the largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	250	8
Process Type #2 (The process type involving the 2nd largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	NA	NA
Process Type #3 (The process type involving the 3rd largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	NA	NA

2.10 State the maximum daily inventory and average monthly inventory of the listed substance that was stored on-site during the reporting year in the form of a bulk chemical.

CBI

[ ]

Maximum daily inventory	NR	kg
Average monthly inventory	NR	kg

[ ] Mark (X) this box if you attach a continuation sheet.

2.11 Related Product Types -- List any byproducts, coproducts, or impurities present with the listed substance in concentrations greater than 0.1 percent as it is manufactured, imported, or processed. The source of byproducts, coproducts, or impurities means the source from which the byproducts, coproducts, or impurities are made or introduced into the product (e.g., carryover from raw material, reaction product, etc.).

CBI

[ ]

CAS No.	Chemical Name	Byproduct, Coproduct or Impurity[1]	Concentration (%) (specify ± % precision)	Source of Byproducts, Coproducts, or Impurities
NA				

[1]Use the following codes to designate byproduct, coproduct, or impurity:

B = Byproduct
C = Coproduct
I = Impurity

[ ] Mark (X) this box if you attach a continuation sheet.

2.12 Existing Product Types -- List all existing product types which you manufactured, imported, or processed using the listed substance during the reporting year. List the quantity of listed substance you use for each product type as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI
[ ]

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	100	0	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.13 Expected Product Types -- Identify all product types which you expect to manufacture, import, or process using the listed substance at any time after your current corporate fiscal year. For each use, specify the quantity you expect to manufacture, import, or process for each use as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI
[ ]

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	100	0	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.14 CBI [ ] Final Product -- Complete the following table for each type of final product manufactured, imported, or processed at your facility that contains the listed substance other than as an impurity.

a. Product Type[1]	b. Final Product's Physical Form[2]	c. Average % Composition of Listed Substance in Final Product	d. Type of End-Users[3]
B	B	30	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the final product's physical form:

A = Gas
B = Liquid
C = Aqueous solution
D = Paste
E = Slurry
F1 = Powder
F2 = Crystalline solid
F3 = Granules
F4 = Other solid
G = Gel
H = Other (specify) _____

[3]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.15 Circle all applicable modes of transportation used to deliver bulk shipments of the CBI listed substance to off-site customers.

[ ] Truck ..... (1)

Railcar 2

Barge, Vessel 3

Pipeline 4

Plane 5

Other (specify) _____ 6

2.16 Customer Use -- Estimate the quantity of the listed substance used by your customers or prepared by your customers during the reporting year for use under each category CBI of end use listed (i-iv).

[ ]

Category of End Use

i. Industrial Products

Chemical or mixture ..... NA kg/yr

Article ..... NA kg/yr

ii. Commercial Products

Chemical or mixture ..... NA kg/yr

Article ..... NA kg/yr

iii. Consumer Products

Chemical or mixture ..... NA kg/yr

Article ..... NA kg/yr

iv. Other

Distribution (excluding export) ..... NA kg/yr

Export ..... NA kg/yr

Quantity of substance consumed as reactant ..... NA kg/yr

Unknown customer uses ..... NA kg/yr

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 3 PROCESSOR RAW MATERIAL IDENTIFICATION

PART A GENERAL DATA

3.01 Specify the quantity purchased and the average price paid for the listed substance for each major source of supply listed. Product trades are treated as purchases.
CBI The average price is the market value of the product that was traded for the listed substance.
[ ]

Source of Supply	Quantity (kg)	Average Price ($/kg)
The listed substance was manufactured on-site.	NA	NA
The listed substance was transferred from a different company site.	NA	NA
The listed substance was purchased directly from a manufacturer or importer.	222,564 1,243,719	1.92 No charge To
The listed substance was purchased from a distributor or repackager.		
The listed substance was purchased from a mixture producer.		

3.02 Circle all applicable modes of transportation used to deliver the listed substance to
CBI your facility.
[ ]

Truck	(1)
Railcar	(2)
Barge, Vessel	3
Pipeline	4
Plane	5
Other (specify) _____	6

[ ] Mark (X) this box if you attach a continuation sheet.

3.03 a. Circle all applicable containers used to transport the listed substance to your CBI facility.

[ ]

Bags 1

Boxes 2

Free standing tank cylinders 3

Tank rail cars ..... (4)

Hopper cars 5

Tank trucks ..... (6)

Hopper trucks 7

Drums 8

Pipeline 9

Other (specify) _____ 10

b. If the listed substance is transported in pressurized tank cylinders, tank rail cars, or tank trucks, state the pressure of the tanks.

Tank cylinders ..... NA mmHg

Tank rail cars ..... NA mmHg

Tank trucks ..... NA mmHg

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RAW MATERIAL IN THE FORM OF A MIXTURE

3.04 If you obtain the listed substance in the form of a mixture, list the trade name(s) of the mixture, the name of its supplier(s) or manufacturer(s), an estimate of the CBI average percent composition by weight of the listed substance in the mixture, and the amount of mixture processed during the reporting year.

[ ]

Trade Name	Supplier or Manufacturer	Average % Composition by Weight (specify ± % precision)	Amount Processed (kg/yr)
NA			

[ ] Mark (X) this box if you attach a continuation sheet.

PART C RAW MATERIAL VOLUME

3.05 CBI [ ] State the quantity of the listed substance used as a raw material during the reporting year in the form of a class I chemical, class II chemical, or polymer, and the percent composition, by weight, of the listed substance.

	Quantity Used (kg/yr)	% Composition by Weight of Listed Substance in Raw Material (specify ± % precision)
Class I chemical	1,466,283	99.9 ± 0.1
Class II chemical	NA	
Polymer	NA	

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 4 PHYSICAL/CHEMICAL PROPERTIES

General Instructions:

If you are reporting on a mixture as defined in the glossary, reply to questions in Section 4 that are inappropriate to mixtures by stating "NA -- mixture."

For questions 4.06-4.15, if you possess any hazard warning statement, label, MSDS, or other notice that addresses the information requested, you may submit a copy or reasonable facsimile in lieu of answering those questions which it addresses.

PART A PHYSICAL/CHEMICAL DATA SUMMARY

4.01 Specify the percent purity for the three major[1] technical grade(s) of the listed substance as it is manufactured, imported, or processed. Measure the purity of the substance in the final product form for manufacturing activities, at the time you import the substance, or at the point you begin to process the substance.

CBI

[ ]

	Manufacture	Import	Process
Technical grade #1	NA % purity	NA % purity	99.9 % purity
Technical grade #2	_____ % purity	_____ % purity	_____ % purity
Technical grade #3	_____ % purity	_____ % purity	_____ % purity

[1]Major = Greatest quantity of listed substance manufactured, imported or processed.

4.02 Submit your most recently updated Material Safety Data Sheet (MSDS) for the listed substance, and for every formulation containing the listed substance. If you possess an MSDS that you developed and an MSDS developed by a different source, submit your version. Indicate whether at least one MSDS has been submitted by circling the appropriate response.

Yes ..... (1)

No 2

Indicate whether the MSDS was developed by your company or by a different source.

Your company ..... (1)

Another source 2

[ ] Mark (X) this box if you attach a continuation sheet.

4.03 Submit a copy or reasonable facsimile of any hazard information (other than an MSDS) that is provided to your customers/users regarding the listed substance or any formulation containing the listed substance. Indicate whether this information has been submitted by circling the appropriate response.

Yes ..... (1)

No 2

4.04 For each activity that uses the listed substance, circle all the applicable number(s) corresponding to each physical state of the listed substance during the activity listed. Physical states for importing and processing activities are determined at the time you import or begin to process the listed substance. Physical states for manufacturing, storage, disposal and transport activities are determined using the final state of the product.

CBI

[ ]

	Physical State				
Activity	Solid	Slurry	Liquid	Liquified Gas	Gas
Manufacture	1	2	3	4	5
Import	1	2	3	4	5
Process	1	2	(3)	4	5
Store	1	2	(3)	4	5
Dispose	1	2	3	4	5
Transport	1	2	(3)	4	5

[ ] Mark (X) this box if you attach a continuation sheet.

4.05 Particle Size -- If the listed substance exists in particulate form during any of the following activities, indicate for each applicable physical state the size and the percentage distribution of the listed substance by activity. Do not include particles ≥10 microns in diameter. Measure the physical state and particle sizes for importing and processing activities at the time you import or begin to process the listed substance. Measure the physical state and particle sizes for manufacturing storage, disposal and transport activities using the final state of the product.

CBI

[ ]

Physical State		Manufacture	Import	Process	Store	Dispose	Transport
Dust	<1 micron			NA			
	1 to <5 microns			NA			
	5 to <10 microns			NA			
Powder	<1 micron			NA			
	1 to <5 microns			NA			
	5 to <10 microns			NA			
Fiber	<1 micron			NA			
	1 to <5 microns			NA			
	5 to <10 microns			NA			
Aerosol	<1 micron			NA			
	1 to <5 microns			NA			
	5 to <10 microns			NA			

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 5 ENVIRONMENTAL FATE

PART A RATE CONSTANTS AND TRANSFORMATION PRODUCTS

5.01 Indicate the rate constants for the following transformation processes.

a. Photolysis:

Absorption spectrum coefficient (peak) .... UK (1/M cm) at _____ nm

Reaction quantum yield, ϕ ..... UK at _____ nm

Direct photolysis rate constant, k_p, at ... UK 1/hr _____ latitude

b. Oxidation constants at 25°C:

For $^1O_2$ (singlet oxygen), k_{ox} ..... UK 1/M hr

For RO_2 (peroxy radical), k_{ox} ..... UK 1/M hr

c. Five-day biochemical oxygen demand, BOD_5 ... UK mg/l

d. Biotransformation rate constant:

For bacterial transformation in water, k_b... UK 1/hr

Specify culture ..... UK

e. Hydrolysis rate constants:

For base-promoted process, k_B ..... UK 1/M hr

For acid-promoted process, k_A ..... UK 1/M hr

For neutral process, k_N ..... UK 1/hr

f. Chemical reduction rate (specify conditions) UK

g. Other (such as spontaneous degradation) ... _____

[ ] Mark (X) this box if you attach a continuation sheet.

PART B PARTITION COEFFICIENTS

5.02 a. Specify the half-life of the listed substance in the following media.

Media	Half-life (specify units)
Groundwater	UK
Atmosphere	UK
Surface water	UK
Soil	UK

b. Identify the listed substance's known transformation products that have a half-life greater than 24 hours.

CAS No.	Name	Half-life (specify units)	Media
NA			in
			in
			in
			in

5.03 Specify the octanol-water partition coefficient, K_{ow} ... UK at 25°C

Method of calculation or determination .....

5.04 Specify the soil-water partition coefficient, K_d ..... UK at 25°C

Soil type .....

5.05 Specify the organic carbon-water partition coefficient, K_{oc} ..... UK at 25°C

5.06 Specify the Henry's Law Constant, H ..... atm-m^3/mole

[ ] Mark (X) this box if you attach a continuation sheet.

5.07 List the bioconcentration factor (BCF) of the listed substance, the species for which it was determined, and the type of test used in deriving the BCF.

Bioconcentration Factor	Species	Test[1]
UK		

[1]Use the following codes to designate the type of test:

F = Flowthrough
S = Static

[ ] Mark (X) this box if you attach a continuation sheet.

6.04 CBI [ ] For each market listed below, state the quantity sold and the total sales value of the listed substance sold or transferred in bulk during the reporting year.

Market	Quantity Sold or Transferred (kg/yr)	Total Sales Value ($/yr)
Retail sales		
Distribution -- Wholesalers		
Distribution -- Retailers		
Intra-company transfer		
Repackagers		
Mixture producers		
Article producers		
Other chemical manufacturers or processors		
Exporters		
Other (specify)		

NR

6.05 CBI [ ] Substitutes -- List all known commercially feasible substitutes that you know exist for the listed substance and state the cost of each substitute. A commercially feasible substitute is one which is economically and technologically feasible to use in your current operation, and which results in a final product with comparable performance in its end uses.

Substitute	Cost ($/kg)
NA	

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 7 MANUFACTURING AND PROCESSING INFORMATION

General Instructions:

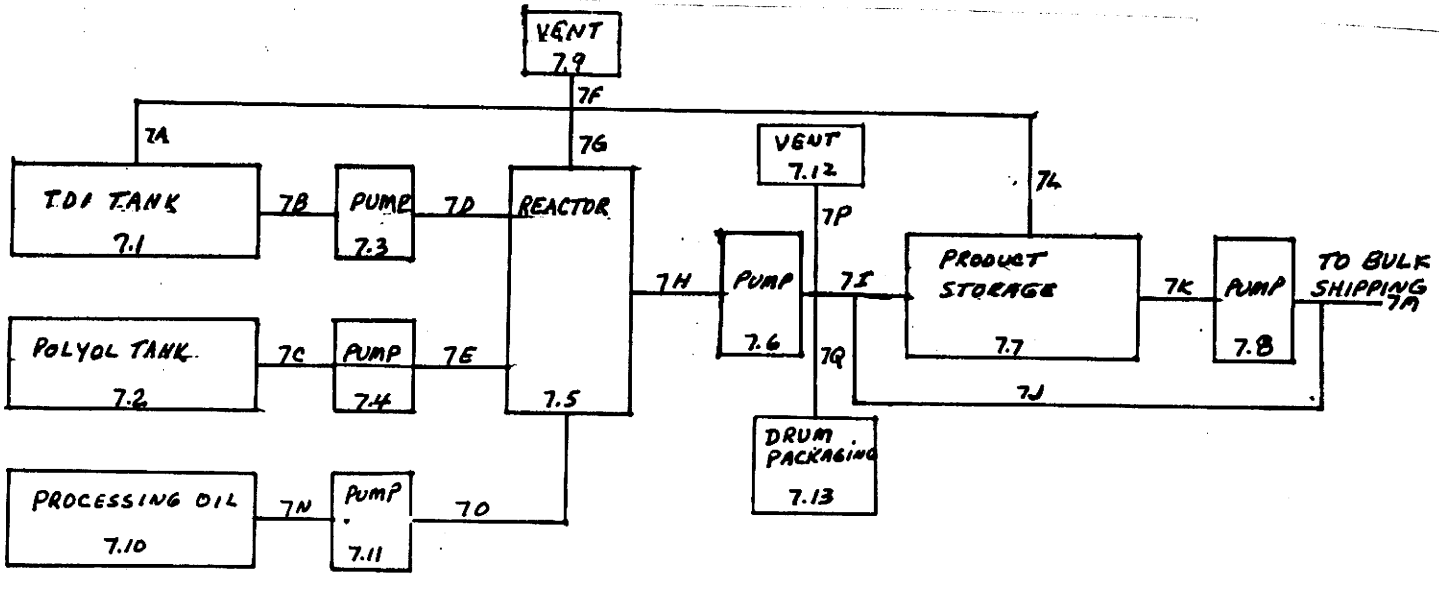
For questions 7.04-7.06, provide a separate response for each process block flow diagram provided in questions 7.01, 7.02, and 7.03. Identify the process type from which the information is extracted.

PART A MANUFACTURING AND PROCESSING PROCESS TYPE DESCRIPTION

7.01 In accordance with the instructions, provide a process block flow diagram showing the major (greatest volume) process type involving the listed substance.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

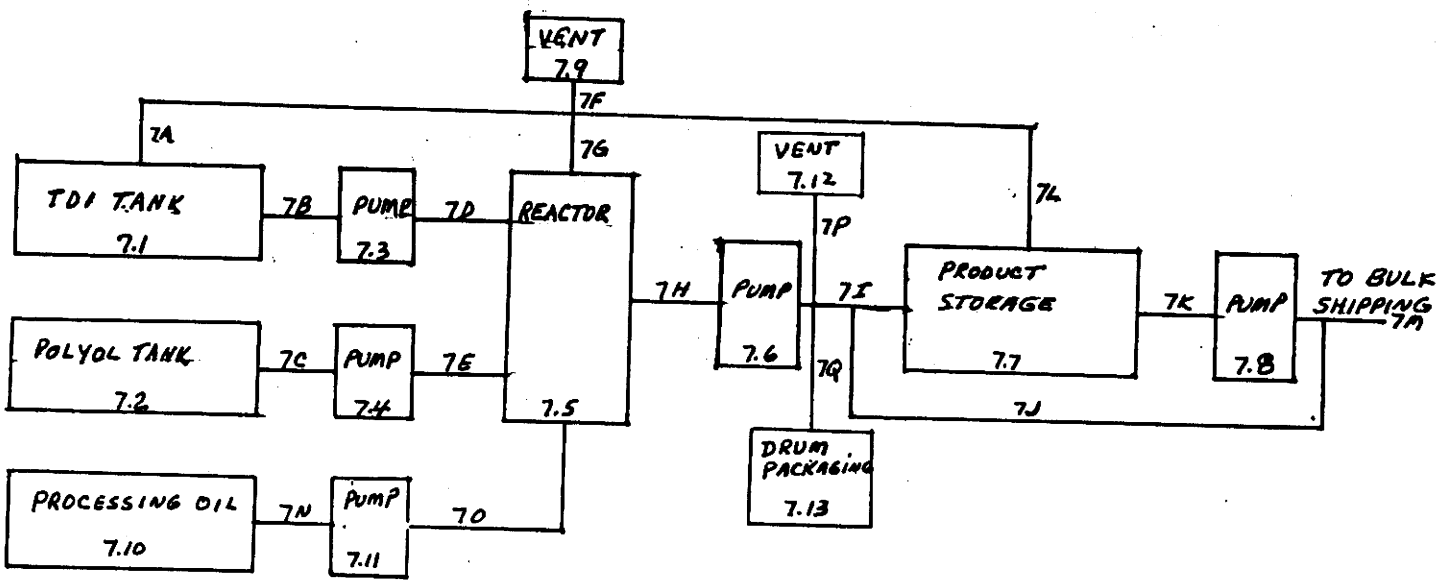


[ ] Mark (X) this box if you attach a continuation sheet.

7.03 In accordance with the instructions, provide a process block flow diagram showing all process emission streams and emission points that contain the listed substance and which, if combined, would total at least 90 percent of all facility emissions if not treated before emission into the environment. If all such emissions are released from one process type, provide a process block flow diagram using the instructions for question 7.01. If all such emissions are released from more than one process type, provide a process block flow diagram showing each process type as a separate block.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS



7.9 TDI TANK, REACTOR, PRODUCT STORAGE TANK

7.4 TDI PUMP SEAL

7.6, 7.8 PRODUCT PUMP SEALS

7.12 DRUM PACKAGING VENT

[ ] Mark (X) this box if you attach a continuation sheet.

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
7.3	TURBINE PUMP	20	<5000	STEEL
7.4	GEAR PUMP	20	<5000	STEEL
7.5	REACTOR	<100	760	S.S.
7.6	GEAR PUMP	<100	<5000	STEEL
7.8	GEAR PUMP	20	<5000	STEEL

[ ] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTORING PROCESS

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7B, 7D	TDI	OL	1,466,283
7C, 7E	PolyoL	OL	1,084,025
7H, 7I, 7J, 7K, 7M	PREPOLYMER A	OL	1,615,219
7N-70	PROCESS OIL	OL	1,105,223
7Q	PREPOLYMER B	OL	2,024,218

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[ ] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7B, 7D	TDI	99.9	HYDROLYZABLE CHLORIDE	0.1%
7C, 7E	Polyol	100 AW	NA	NA
7N, 7O	PROCESSING OIL	100 AW	NA	NA
7H, 7I, 7J, 7K, 7M	PREPOLYMER A	35% AW	NA	NA
7Q	PREPOLYMER B	5% AW	NA	NA

7.06 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

7.06 (continued)

[1]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column b. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1	PROCESSING OIL	100 %
2		
3		
4		
5		

[2]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

[3]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 8 RESIDUAL TREATMENT GENERATION, CHARACTERIZATION, TRANSPORTATION, AND MANAGEMENT

General Instructions:

For questions 8.04-8.06, provide a separate response for each residual treatment block flow diagram provided in question 8.01, 8.02 or 8.03. Identify the process type from which the information is extracted.

For questions 8.05-8.33, the Stream Identification Codes are those process streams listed in either the Section 7 or Section 8 block flow diagrams which contain residuals for each applicable waste management method.

For questions 8.07-8.33, if residuals are combined before they are handled, list those Stream Identification Codes on the same line.

Questions 8.09-8.33 refer to the waste management activities involving the residuals identified in either the Section 7 or Section 8 block flow diagrams. Not all Stream Identification Codes used in the sample answers (e.g., for the incinerator questions) have corresponding process streams identified in the block flow diagram(s). These Stream Identification codes are for illustrative purposes only.

For questions 8.11-8.33, if you have provided the information requested on one of the EPA Office of Solid Waste surveys listed below within the three years prior to your reporting year, you may submit a copy or reasonable facsimile in lieu of answering those questions which the survey addresses. The applicable surveys are: (1) Hazardous Waste Treatment, Storage, Disposal, and Recycling Survey; (2) Hazardous Waste Generator Survey; or (3) Subtitle D Industrial Facility Mail Survey.

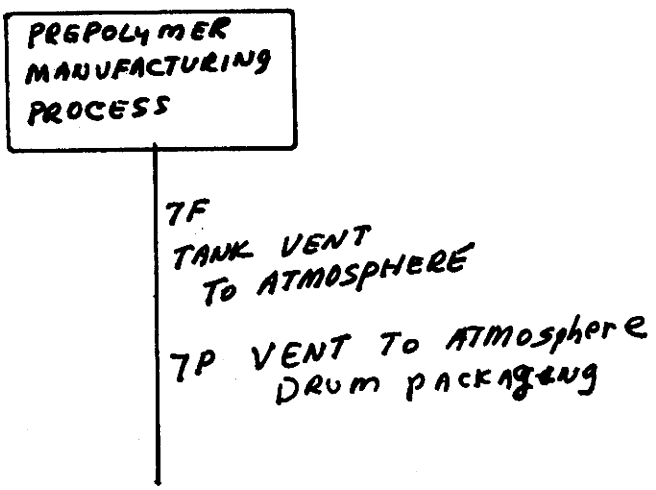
[ ] Mark (X) this box if you attach a continuation sheet.

PART A RESIDUAL TREATMENT PROCESS DESCRIPTION

8.01 In accordance with the instructions, provide a residual treatment block flow diagram which describes the treatment process used for residuals identified in question 7.01.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS



[ ] Mark (X) this box if you attach a continuation sheet.

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

a. Stream ID Code	b. Type of Hazardous Waste[1]	c. Physical State of Residual[2]	d. Known Compounds[3]	e. Concentrations (% or ppm)[4,5,6]	f. Other Expected Compounds	g. Estimated Concentrations (% or ppm)
7F	T	GU	TDI	50 PPM EV	NA	NA
7P	T	GU	TDI	30 PPM EV	NA	NA

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[1]Use the following codes to designate the type of hazardous waste:

I = Ignitable
C = Corrosive
R = Reactive
E = EP toxic
T = Toxic
H = Acutely hazardous

[2]Use the following codes to designate the physical state of the residual:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[3]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column d. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1	PROCESS OIL	100 A
2		
3		
4		
5		

[4]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[5]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[6]Specify the analytical test methods used and their detection limits in the table below. Assign a code to each test method used and list those codes in column e.

Code	Method	Detection Limit (± ug/l)
1	N.A	
2		
3		
4		
5		
6		

[ ] Mark (X) this box if you attach a continuation sheet.

8.06 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

a. Stream ID Code	b. Waste Description Code[1]	c. Management Method Code[2]	d. Residual Quantities (kg/yr)	e. Management of Residual (%) On-Site	e. Management of Residual (%) Off-Site	f. Costs for Off-Site Management (per kg)	g. Changes in Management Methods
7F	B91	M5	5.5	NA	NA	NA	NA
7P	B91	M5	0.31	NA	NA	NA	NA

[1]Use the codes provided in Exhibit 8-1 to designate the waste descriptions

[2]Use the codes provided in Exhibit 8-2 to designate the management methods

[ ] Mark (X) this box if you attach a continuation sheet.

8.22 Describe the combustion chamber design parameters for each of the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Incinerator	Combustion Chamber Temperature (°C)		Location of Temperature Monitor		Residence Time In Combustion Chamber (seconds)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
1						
2						
3						

NR

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

8.23 Complete the following table for the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Incinerator	Air Pollution Control Device[1]	Types of Emissions Data Available
1	NA	NA
2	NA	NA
3	NA	NA

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

[1]Use the following codes to designate the air pollution control device:

S = Scrubber (include type of scrubber in parenthesis)
E = Electrostatic precipitator
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 9 WORKER EXPOSURE

General Instructions:

Questions 9.03-9.25 apply only to those processes and workers involved in manufacturing or processing the listed substance. Do not include workers involved in residual waste treatment unless they are involved in this treatment process on a regular basis (i.e., exclude maintenance workers, construction workers, etc.).

[ ] Mark (X) this box if you attach a continuation sheet.

PART A EMPLOYMENT AND POTENTIAL EXPOSURE PROFILE

9.01 Mark (X) the appropriate column to indicate whether your company maintains records on the following data elements for hourly and salaried workers. Specify for each data element the year in which you began maintaining records and the number of years the records for that data element are maintained. (Refer to the instructions for further explanation and an example.)

CBI

[ ]

Data Element	Data are Maintained for: Hourly Workers	Salaried Workers	Year in Which Data Collection Began	Number of Years Records Are Maintained
Date of hire	X	X	1979	10
Age at hire	X	X	1979	10
Work history of individual before employment at your facility	NA	X	1979	10
Sex	X	X	1979	10
Race	X	X	1979	10
Job titles	X	X	1979	10
Start date for each job title	NA	NA	NA	NA
End date for each job title	NA	NA	NA	NA
Work area industrial hygiene monitoring data	NA	NA	NA	NA
Personal employee monitoring data	NA	NA	NA	NA
Employee medical history	NA	NA	NA	NA
Employee smoking history	NA	NA	NA	NA
Accident history	X	X	1979	10
Retirement date	NA	NA	NA	NA
Termination date	X	X	1979	10
Vital status of retirees	NA	NA	NA	NA
Cause of death data	NA	NA	NA	NA

[ ] Mark (X) this box if you attach a continuation sheet.

9.02 In accordance with the instructions, complete the following table for each activity in which you engage.

CBI

[ ]

a. Activity	b. Process Category	c. Yearly Quantity (kg)	d. Total Workers	e. Total Worker-Hours
Manufacture of the listed substance	Enclosed	NA		
	Controlled Release	NA		
	Open	NA		
On-site use as reactant	Enclosed	NA		
	Controlled Release	NA		
	Open	NA		
On-site use as nonreactant	Enclosed	NA		
	Controlled Release	NA		
	Open	NA		
On-site preparation of products	Enclosed	1466283	6	12000
	Controlled Release	NA		
	Open	NA		

[ ] Mark (X) this box if you attach a continuation sheet.

9.03 Provide a descriptive job title for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance.

CBI

[ ]

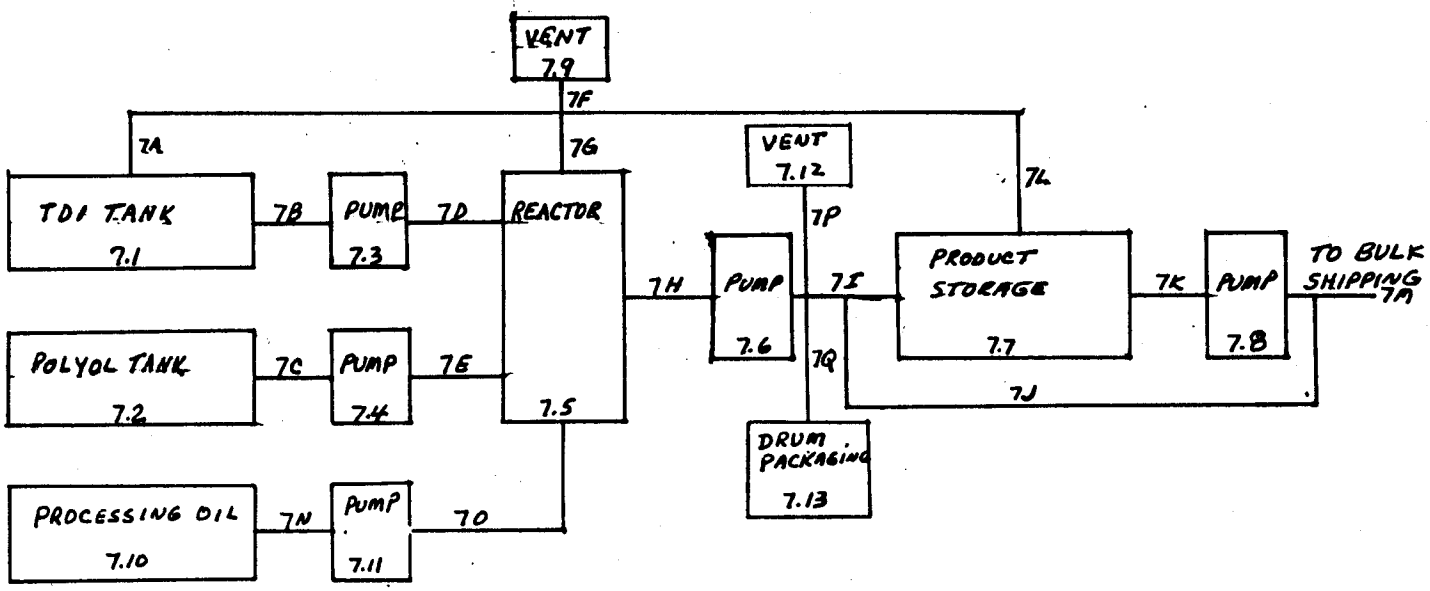
Labor Category	Descriptive Job Title
A	SUPERVISOR- COMPOUNDER
B	FOREMAN
C	SMALL COMPOUNDER
D	LABORERS (DIRECT)
E	
F	
G	
H	
I	
J	

[ ] Mark (X) this box if you attach a continuation sheet.

9.04 In accordance with the instructions, provide your process block flow diagram(s) and indicate associated work areas.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS



AREA - 1

[ ] Mark (X) this box if you attach a continuation sheet.

9.05 Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work Area ID	Description of Work Areas and Worker Activities
1	STORAGE TANKS, REACTORS, BULK LOADING AND DRUM PACKAGING (WORKERS CHARGE REACTORS, MONITOR TEMPERATURES, FILL DRUMS, FILL TANK TRUCKS AND LOAD TRUCKS)
2	
3	
4	
5	
6	
7	
8	
9	
10	

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question
CBI and complete it separately for each process type and work area.

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work area 1

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
A,B,C,D	6	INHALATION	GU	D	250
A,B,C,D	6	DIRECT SKIN CONTACT	OL	A	250

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work area 1

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
UK	UK	UK

[ ] Mark (X) this box if you attach a continuation sheet.

PART B WORK PLACE MONITORING PROGRAM

9.08 If you monitor worker exposure to the listed substance, complete the following table.

CBI

[ ]

Sample/Test	Work Area ID	Testing Frequency (per year)	Number of Samples (per test)	Who Samples[1]	Analyzed In-House (Y/N)	Number of Years Records Maintained
Personal breathing zone	NA					
General work area (air)	NA					
Wipe samples	NA					
Adhesive patches	NA					
Blood samples	NA					
Urine samples	NA					
Respiratory samples	NA					
Allergy tests	NA					
Other (specify) _____						
Other (specify) _____						
Other (specify) _____						

[1]Use the following codes to designate who takes the monitoring samples:

A = Plant industrial hygienist
B = Insurance carrier
C = OSHA consultant
D = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

9.09 For each sample type identified in question 9.08, describe the type of sampling and analytical methodology used for each type of sample.

CBI

[ ]	Sample Type	Sampling and Analytical Methodology
	NA	
	NA	
	NA	
	NA	
	NA	

9.10 If you conduct personal and/or ambient air monitoring for the listed substance, specify the following information for each equipment type used.

CBI

[ ]	Equipment Type[1]	Detection Limit[2]	Manufacturer	Averaging Time (hr)	Model Number
	NA				
	NA				
	NA				
	NA				
	NA				

[1]Use the following codes to designate personal air monitoring equipment types:

A = Passive dosimeter
B = Detector tube
C = Charcoal filtration tube with pump
D = Other (specify) _____

Use the following codes to designate ambient air monitoring equipment types:

E = Stationary monitors located within work area
F = Stationary monitors located within facility
G = Stationary monitors located at plant boundary
H = Mobile monitoring equipment (specify) _____
I = Other (specify) _____

[2]Use the following codes to designate detection limit units:

A = ppm
B = Fibers/cubic centimeter (f/cc)
C = Micrograms/cubic meter (μ/m^3)

[ ] Mark (X) this box if you attach a continuation sheet.

9.11 If you conduct routine medical tests for monitoring the health effects of exposure to the listed substance, specify the type and frequency of the tests.

CBI

[ ]	Test Description	Frequency (weekly, monthly, yearly, etc.)
	NA	

[ ] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER M

Work area 1

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1979	N	N
General dilution	N			
Other (specify)				
Vessel emission controls	Y	1987	N	N
Mechanical loading or packaging equipment	N			
Other (specify)				

[ ] Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work area 1

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
NONE	

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work area 1

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	Y
Face shields	Y
Coveralls	Y
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	
AIR SUPPLIED HELMET	Y

[ ] Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Work Area	Respirator Type	Average Usage[1]	Fit Tested (Y/N)	Type of Fit Test[2]	Frequency of Fit Tests (per year)
1	AIR SUPPLIED HELMET	E	N	NA	NA

[1]Use the following codes to designate average usage:

A = Daily
B = Weekly
C = Monthly
D = Once a year
E = Other (specify) AS REQUIRED BY PRODUCTION schedule

[2]Use the following codes to designate the type of fit test:

QL = Qualitative
QT = Quantitative

[ ] Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this CBI question and complete it separately for each process type and work area.

[ ]

Process type ..... PREPOLYMER MANUFACTURE PROCESS

Work area 1

LIMITED ACCESS, PLACARDING, AIR SUPPLIED HELMET USE, EYE PROTECTION, PROTECTIVE CLOTHING

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type ..... PREPOLYMER MANUFACTURE PROCESS

Work area 1

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping	NA			
Vacuuming	NA			
Water flushing of floors	NA			
Other (specify)				
CLEAN UP WHEN SPILLS OR LEAKS OCCUR	X			

[ ] Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

No 2

NR

Emergency exposure

Yes 1

No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: _____

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes 1

No ..... (2)

If yes, where are copies of the plan maintained? _____

Has this plan been coordinated with state or local government response organizations? Circle the appropriate response.

Yes 1

No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

NR

Plant safety specialist 1

Insurance carrier 2

OSHA consultant 3

Other (specify) _____ 4

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 10 ENVIRONMENTAL RELEASE

General Instructions:

Complete Part E (questions 10.23-10.35) for each non-routine release involving the listed substance that occurred during the reporting year. Report on all releases that are equal to or greater than the listed substance's reportable quantity value, RQ, unless the release is federally permitted as defined in 42 U.S.C. 9601, or is specifically excluded under the definition of release as defined in 40 CFR 302.3(22). Reportable quantities are codified in 40 CFR Part 302. If the listed substance is not a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and, thus, does not have an RQ, then report releases that exceed 2,270 kg. If such a substance however, is designated as a CERCLA hazardous substance, then report those releases that are equal to or greater than the RQ. The facility may have answered these questions or similar questions under the Agency's Accidental Release Information Program and may already have this information readily available. Assign a number to each release and use this number throughout this part to identify the release. Releases over more than a 24-hour period are not single releases, i.e., the release of a chemical substance equal to or greater than an RQ must be reported as a separate release for each 24-hour period the release exceeds the RQ.

For questions 10.25-10.35, answer the questions for each release identified in question 10.23. Photocopy these questions and complete them separately for each release.

PART A GENERAL INFORMATION

10.01 Where is your facility located? Circle all appropriate responses.

CBI

[ ] Industrial area ..... (1)

Urban area ..... (2)

Residential area 3

Agricultural area 4

Rural area 5

Adjacent to a park or a recreational area 6

Within 1 mile of a navigable waterway ..... (7)

Within 1 mile of a school, university, hospital, or nursing home facility 8

Within 1 mile of a non-navigable waterway 9

Other (specify) _____ 10

[ ] Mark (X) this box if you attach a continuation sheet.

10.02 Specify the exact location of your facility (from central point where process unit is located) in terms of latitude and longitude or Universal Transverse Mercader (UTM) coordinates.

Latitude ..... 35 ° 03 ' 39 "

Longitude ..... 85 ° 16 ' 33 "

UTM coordinates ..... Zone _____, Northing _____, Easting _____

10.03 If you monitor meteorological conditions in the vicinity of your facility, provide the following information.

NR

Average annual precipitation ..... _____ inches/year

Predominant wind direction ..... _____

10.04 Indicate the depth to groundwater below your facility.

NR

Depth to groundwater ..... _____ meters

10.05 For each on-site activity listed, indicate (Y/N/NA) all routine releases of the listed substance to the environment. (Refer to the instructions for a definition of Y, N, and NA.)

CBI

[ ]

On-Site Activity	Environmental Release		
	Air	Water	Land
Manufacturing	NA	NA	NA
Importing	NA	NA	NA
Processing	Y	N	N
Otherwise used	NA	NA	NA
Product or residual storage	Y	N	N
Disposal	NA	NA	NA
Transport	NA	NA	NA

[ ] Mark (X) this box if you attach a continuation sheet.

10.06 Provide the following information for the listed substance and specify the level of precision for each item. (Refer to the instructions for further explanation and an example.)

CBI

[ ]

Quantity discharged to the air	5.8	kg/yr ±	25 %
Quantity discharged in wastewaters	NA	kg/yr ±	0 %
Quantity managed as other waste in on-site treatment, storage, or disposal units	NA	kg/yr ±	0 %
Quantity managed as other waste in off-site treatment, storage, or disposal units	NA	kg/yr ±	0 %

ESTIMATE CALCULATIONS BASED ON INFORMATION CONTAINED IN THE PUBLICATION "ESTIMATING RELEASES AND WASTE TREATMENT EFFICIENCES FOR THE TOXIC CHEMICAL RELEASE INVENTORY FORM" PUBLISHED BY THE EPA.

[ ] Mark (X) this box if you attach a continuation sheet.

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Stream ID Code	Control Technology	Percent Efficiency
NONE		

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

10.09 CBI [ ] Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

Process type ..... PREPOLYMER MANUFACTURING PROCESS

Point Source ID Code	Description of Emission Point Source
7F	REACTOR VENT
7P	DRUM PACKAGING

[ ] Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ] Mark (X) this box if you attach a continuation sheet.

Point Source ID Code	Physical State[1]	Average Emissions (kg/day)	Frequency[2] (days/yr)	Duration[3] (min/day)	Average Emission Factor[4]	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
7F	V	0.0696	79	90	0.000004	0.00005	20	425
7P	V	0.0027	113	180	0.000028	0.000015	113	180

[1]Use the following codes to designate physical state at the point of release:
G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

[2]Frequency of emission at any level of emission

[3]Duration of emission at any level of emission

[4]Average Emission Factor — Provide estimated (± 25 percent) emission factor (kg of emission per kg of production of listed substance)

10.11 Stack Parameters -- Identify the stack parameters for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ]

Point Source ID Code	Stack Height(m)	Stack Inner Diameter (at outlet) (m)	Exhaust Temperature (°C)	Emission Exit Velocity (m/sec)	Building Height(m)[1]	Building Width(m)[2]	Vent Type[3]
7.12	7.6	0.28	25	UK	5.8	55	V

[1]Height of attached or adjacent building

[2]Width of attached or adjacent building

[3]Use the following codes to designate vent type:

H = Horizontal
V = Vertical

[ ] Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Percentage of time per year that the listed substance is exposed to this process type 40%

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					
	Less than 5%	5-10%	11-25%	26-75%	76-99%	Greater than 99%
Pump seals[1]						
Packed	NA	1	NA	2	NA	NA
Mechanical	NA	NA	NA	NA	NA	NA
Double mechanical[2]	NA	NA	NA	NA	NA	NA
Compressor seals[1]	NA	NA	NA	NA	NA	NA
Flanges	NA	2	NA	2	NA	2
Valves						
Gas[3]	NA	NA	NA	NA	NA	NA
Liquid	NA	3	NA	5	NA	13
Pressure relief devices[4] (Gas or vapor only)	1	NA	NA	NA	NA	NA
Sample connections						
Gas	NA	NA	NA	NA	NA	NA
Liquid	NA	1	NA	1	NA	NA
Open-ended lines[5] (e.g., purge, vent)						
Gas	1	NA	NA	NA	NA	NA
Liquid	NA	NA	NA	NA	NA	NA

[1]List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

[ ] Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

[2]If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

[3]Conditions existing in the valve during normal operation

[4]Report all pressure relief devices in service, including those equipped with control devices

[5]Lines closed during normal operation that would be used during maintenance operations

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c.

CBI

[ ]

a. Number of Pressure Relief Devices	b. Percent Chemical in Vessel[1]	c. Control Device	d. Estimated Control Efficiency[2]
1	26-75 %	RUPTURE DISC	100 %

[1]Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

[2]The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

[ ] Mark (X) this box if you attach a continuation sheet.

10.15 Equipment Leak Detection -- If a formal leak detection and repair program is in place, complete the following table regarding those leak detection and repair procedures. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER MANUFACTURING PROCESS

Equipment Type	Leak Detection Concentration (ppm or mg/m^3) Measured at ____ Inches from Source	Detection Device[1]	Frequency of Leak Detection (per year)	Repairs Initiated (days after detection)	Repairs Completed (days after initiated)
Pump seals					
Packed	NA				
Mechanical	NA				
Double mechanical	NA				
Compressor seals	NA				
Flanges	NA				
Valves					
Gas	NA				
Liquid	NA				
Pressure relief devices (gas or vapor only)	NA				
Sample connections					
Gas	NA				
Liquid	NA				
Open-ended lines					
Gas	NA				
Liquid	NA				

[1]Use the following codes to designate detection device:

POVA = Portable organic vapor analyzer
FPM = Fixed point monitoring
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

10.16 Raw Material, Intermediate and Product Storage Emissions - - Complete the following table by providing the information on each liquid raw material, intermediate, and product storage vessel containing the listed substance as identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Vessel Type[1]	Floating Roof Seals[2]	Composition of Stored Materials[3]	Throughput (liters per year)	Vessel Filling Rate (gpm)	Vessel Filling Duration (min)	Vessel Inner Diameter (m)	Vessel Height (m)	Operating Vessel Volume (l)	Vessel Emission Controls[4]	Design Flow Rate[5]	Vent Diameter (cm)	Control Efficiency (%)	Basis for Estimate[6]
F	NA	100 (0)	1.0	40	118	2.44	6.1	28523	VENT	NA	7.6	0	C
F	NA	100 (0)	1.0	40	118	2.44	6.1	28523	VENT	NA	7.6	0	C
F-H	NA	35 (0)	0.5	25	1006	3.2	11.84(4)	95223	VENT	NA	7.6	0	C

[1]Use the following codes to designate vessel type:

F = Fixed roof
CIF = Contact internal floating roof
NCIF = Noncontact internal floating roof
EFR = External floating roof
P = Pressure vessel (indicate pressure rating)
H = Horizontal
U = Underground

[2]Use the following codes to designate floating roof seals:

MS1 = Mechanical shoe, primary
MS2 = Shoe-mounted secondary
MS2R = Rim-mounted, secondary
LM1 = Liquid-mounted resilient filled seal, primary
LM2 = Rim-mounted shield
LMW = Weather shield
VM1 = Vapor mounted resilient filled seal, primary
VM2 = Rim-mounted secondary
VMW = Weather shield

[3]Indicate weight percent of the listed substance. Include the total volatile organic content in parenthesis

[4]Other than floating roofs

[5]Gas/vapor flow rate the emission control device was designed to handle (specify flow rate units)

[6]Use the following codes to designate basis for estimate of control efficiency:

C = Calculations
S = Sampling

[ ] Mark (X) this box if you attach a continuation sheet.

PART E NON-ROUTINE RELEASES

10.23 Indicate the date and time when the release occurred and when the release ceased or was stopped. If there were more than six releases, attach a continuation sheet and list all releases.

Release	Date Started	Time (am/pm)	Date Stopped	Time (am/pm)
1	NONE			
2				
3				
4				
5				
6				

10.24 Specify the weather conditions at the time of each release.

NR

Release	Wind Speed (km/hr)	Wind Direction	Humidity (%)	Temperature (°C)	Precipitation (Y/N)
1					
2					
3					
4					
5					
6					

[ ] Mark (X) this box if you attach a continuation sheet.

TyrFil®

EMERGENCY HANDBOOK

This handbook has been prepared by the Synair Corporation solely for our customers' use. The suggestions below pertain only to products manufactured by the Synair Corporation and are not intended to cover every situation or be a complete solution to all problems that customers may encounter.

THE PROCEDURES OUTLINED HEREIN SHOULD BE READILY AVAILABLE TO ALL EMPLOYEES AND SHOULD BE ON FILE WITH YOUR LOCAL EMERGENCY FACILITIES ALONG WITH ALL MATERIAL SAFETY DATA SHEETS FOR SYNAIR PRODUCTS HANDLED BY OUR CUSTOMERS.

TyrFil consists of two drums, one is the catalyst and the other is the prepolymer.

I. PUNCTURES - ERUPTIONS -SPILLAGE

A. PUNCTURES

Punctures to drums may occur at any time due to a variety of accidents, although Synair places its TyrFil products into D.0.T. approved containers. For example: a drum may be dropped on its edge, an industrial lift fork may be pushed through a drum or even by a large tire falling on a drum.

Normally, punctures result in "seepage" or flow of the material that drains onto the floor and/or surrounding materials.

1. Catalyst Side

If a drum of catalyst has been punctured, the drum should be turned over so that only a small amount of the product is lost.

The material that has leaked from the damaged drum may be prevented from spreading by building a dike around the spill or leak. The dike should be built from an absorbent material such as "oil dry", "vermiculite", "wet sand", or even "cat litter".

The dike should be constructed so that the spill will not spread or enter into any sewer or open drains. The spill should be covered with absorbent material such as "oil dry", "vermiculite", or "wet sand". After soaking up the spill, the absorbent material may be cleaned up by using a shovel. Stains on the floor may be removed by wiping clean with rags and isopropyl alcohol, or Synair Blend solvent.

The leaky drum can be drained into a clean empty drum or an empty "catalyst" side drum that has been sealed. Also, it may be possible to repair the hole in the damaged drum by using a metal repair material such as "bondo". NOTE: When repairing the drum always take precautionary steps to prevent contamination of the product left in the damaged drum.

2. Prepolymer Side

If a drum of prepolymer has been punctured, the drum should be turned over so that only a small amount of the product is lost.

The material that has leaked from the damaged drum may be prevented from spreading by building a dike around the spill or leak. The dike should be built from an absorbent material such as "oil dry", "vermiculite", "wet sand", or even "cat litter".

The dike should be constructed so that the spill will not spread or enter into any sewer or open drains. The spill should be covered with absorbent material such as "oil dry", "vermiculite", or "wet sand".

After soaking up the spill, shovel the mixture into an open container. To neutralize the product, Synair recommends a neutralizer consisting of 90% water, 2% detergent and 8% concentrated ammonia. The detergent can be any dishwashing detergent such as Ivory. The ammonia can be a brand such as Parson's.

Pour the neutralizer into the open container of absorbed material and STIR.

Pour some of the neutralizer on the soiled floor area to neutralize the residue of material remaining that has not been absorbed.

The neutralizer will cause the material to cure and needs 24 hours to make the product completely solid. ***CAUTION: THE NEUTRALIZATION OF THE ABSORBED PRODUCT IN THE OPEN CONTAINER SHOULD BE DONE IN AN AREA WHERE THERE IS ADEQUATE VENTILATION AS THE NEUTRALIZER WILL GENERATE CARBON DIOXIDE GAS.*** The neutralizer may also cause the prepolymer to foam.

After 24 hours, this material should be disposed of as solid waste. DISPOSE THE SOLID WASTE MASS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

The contents of the punctured drums should be drained into a clean empty drum or an empty prepolymer drum that has been sealed. It may be possible to repair the hole in the damaged drum by using a metal repair material such as "bondo". ***NOTE: When repairing the drums always take precautionary steps to prevent contamination of the product left in the damaged drums.***

B. ERUPTIONS

Mostly, eruptions occur from two sources, extremely high heat and water contamination on the prepolymer side. High temperature necessary for a drum to erupt is at such extremes that this shouldn't be a major consideration. Water contamination basically is another matter. Water contamination is best handled by not letting it happen. All drums should be stored inside, but if drums are stored outside they should be covered with plastic or a tarp so that the drums are protected from water and the elements.

1. Prepolymer Side

If a prepolymer drum has been contaminated by water, ***DO NOT USE THE PRODUCT***. First relieve the pressure on the drum. If the drum has erupted,

or ruptured, all pressure has previously been relieved. Next, drain the remaining liquid in the drum into an open empty drum. Build a dike around the product that has spilled on the floor so that it doesn't spread any further. The dike should be built from an absorbent material such as "oil dry", "vermiculite", "wet sand", or even "cat litter". Build the dike so that the areas of the spill do not enter a sewer drain or open drain. Cover the spilled product on the floor with an absorbent material such as "oil dry", "vermiculite", or "wet sand". Once the liquid has been absorbed it should be shoveled into an empty container. Both drums, the prepolymer side drum and the open container, need to be neutralized. A quantity of neutralizer should be kept on hand in case of an emergency. Synair recommends a neutralizing solution consisting of 90% water, 2% detergent and 8% concentrated ammonia. The detergent can be any dishwashing detergent such as Ivory. The ammonia can be a brand such as Parson's. This neutralizer should be poured into both open containers and stirred. Pour some of the neutralizer on the area on the floor to neutralize the product not absorbed. ***CAUTION: THE NEUTRALIZATION OF THE ABSORBED PRODUCT IN THE OPEN CONTAINER SHOULD BE DONE IN AN AREA WHERE THERE IS ADEQUATE VENTILATION AS THE NEUTRALIZER WILL GENERATE CARBON DIOXIDE GAS.*** The neutralizer may also cause the prepolymer to foam. The neutralizer will also cause the mixture to cure into a solid mass. AFTER 24 HOURS DISPOSE THE SOLID MASS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

C. SPILLAGE

Spillage occurs during the normal process of filling tires. It can also occur during drum changes. Small spills are easy to clean up, just wipe them up with a rag. Large spills are more difficult to remove.

1. Large Spills

Large spills should be handled according to the product involved. The catalyst and/or mixed TyrFil are handled identically while the prepolymer is handled differently.

Large spills of catalyst and mixed TyrFil should first be prevented from spreading by building a dike around the spilled product. This dike should be built from an absorbent material such as "oil dry", "vermiculite", or "wet sand". Be sure to prevent any of the product from going into sewer or open drains. Then the liquid should be covered with an absorbent material such as "oil dry", "vermiculite", "wet sand", or rags. After the liquid has been absorbed, shovel the mixture into an open empty drum and DISPOSE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

Large spills of prepolymer should first be prevented from spreading by building a dike around the spilled product. The dike should be built from an absorbent material such as "oil dry", "vermiculite", or "wet sand". The dike

should be consructed so that the spill will not spread or enter into any sewer or open drains. The spill should then be covered with an absorbent material such as "oil dry", "vermiculite", or "wet sand". After the liquid has been absorbed, shovel the mixture into an empty open drum and neutralize. A quantity of neutralizer should be kept on hand in case of an emergency. Synair recommends a neutralizing solution consisting of 90% water, 2% detergent and 8% concentrated ammonia. The detergent can be a brand such as Ivory or another dishwashing detergent. The ammonia can be a brand such as Parson's. The neutralizer is poured into the open drum and stirred into the mixture. Pour some of the neutralizer on the area of the floor to neutralize the product not absorbed. Remember that the neutralizer will generate carbon dioxide gas and will generate a large quantity of foam. This neutralizer will allow the mixture to solidify within 24 hours. ***BE SURE TO DO THIS IN AN AREA WITH ADEQUATE VENTILATION.*** AFTER 24 HOURS DISPOSE THE MIXTURE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

II. FIRE

Fire can occur suddenly and unexpectedly, therefore, it is important that everyone be familiar with the essential steps to take. If a fire should occur, consider four different areas: catalyst, prepolymer, cured TyrFil and solvents.

1. Catalyst Side

The catalyst has a flash point of 350°F. It can be extinguished with water spray, carbon dioxide or dry chemical extinguishers. There are no special fire fighting procedures or unusual fire or explosion hazards with the catalyst.

2. Prepolymer Side

The prepolymer has a flash point of 360°F. It can be extinguished with water spray, carbon dioxide or dry chemical extinguishers. There are no unusual fire or explosion hazards.

3. Cured TyrFil

Flash point on cured TyrFil is not applicable. It can be extinguished with water spray, carbon dioxide or dry chemical extinguishers. ***Persons engaged in fighting polyurethane fires must be protected against carbon monoxide and nitrogen dioxide and should wear self contained breathing apparatus.*** There are no unusual fire or explosion hazards.

4. Solvents

The Synair Corporation recommends only two solvents to clean out your pumping system. They are isopropyl alcohol and Synair Blend.

Isopropyl alcohol has a flash point of 53°F. It can be extinguished with water spray, carbon dioxide, alcoholic foam or dry chemical extinguishers. DO NOT USE A DIRECT WATER STREAM. Fire fighters should wear self-contained breathing apparatus and full protective clothing. Use water spray to cool nearby containers and structures exposed to fire. Extinguish all nearby sources of ignition because vapors may be moved by air currents to ignition sources distant from the handling point.

Synair Blend is a combination of perchlorethylene and mineral spirits and has a flash point of 150°F. It can be extinguished with water spray, carbon dioxide, regular foam or dry chemical extinguishers. ***Fire fighters should wear self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode when fighting fires.*** Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited by heat, pilot lights, other flames and ignition sources at locations distant from material handling point.

Cleaning a mixing tube by burning is a common practice used by many processors. Propane torches used to melt the cured TyrFil from the plugged mixers generate hazardous fumes. These fumes arise from incomplete burning. *DO NOT* breathe the fumes which contain carbon monoxide. Burn out mixers always in the open or allow a fan to blow the fumes away from you. Also wear a respirator capable of cleaning the air of unburned particles from the air you are breathing.

WASTE DISPOSAL

It is necessary that excess TyrFil, drums, and solvent be disposed in accordance with all local, state, and federal regulations.

EXCESS TYRFIL:

EXCESS TYRFIL FALLS INTO TWO CATEGORIES

1. **Empy Drums Over A Year Old That Contain TyrFil**

   In order to get rid of these drums, and the product in them, Synair recommends that you follow this procedure:

   Cut the top out of the catalyst drum. Drain the prepolymer drum into the open drum. Set the drained drum off to one side. Stir this material together. Continue this process, alternating catalyst and prepolymer side drums, until the open drum is 1/3 full. Allow this material to cure for 24 hours. If the material has not cured to a solid mass, add more prepolymer side and mix again. Check and add extra prepolymer until you obtain a solid mass and then dispose of as a solid waste. BE SURE TO DISPOSE OF THE SOLID MASS ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS. The procedure should be continued until the excess TyrFil is a solid mass.

   Disposal of empty drums. Disposal of the catalyst side drum is no problem, providing it has been drained properly. It can be sold to a local drum reclamation company or crushed and sold to a local scrap yard. If it has been crushed it can also be sent to a landfill. DISPOSAL SHOULD ALWAYS BE DONE ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS.

   The prepolymer side drum must be neutralized before disposal. Synair recommends a neutralizing solution consisting of 90% water, 2% detergent and 8% concentrated ammonia. The detergent can be a brand such as Ivory or any other dishwashing detergent. The ammonia can be a brand such as Parson's. Manufacture the neutralizer and pour it into the drum. Rotate the drum, sloshing the neutralizer onto the sides of the drum. This action will coat all the insides of the drum. (DO NOT SEAL THE DRUM AFTER PUTTING IN THE NEUTRALIZING SOLUTION. THIS NEUTRALIZER GENERATES CARBON DIOXIDE GAS AND IF ENCLOSED COULD BURST THE DRUM.) BE SURE TO DO THIS IN AN AREA WHERE THERE IS ADEQUATE VENTILATION. Leave the solution in the drum for 24 hours.

This will allow it to completely solidify the remaining prepolymer. Excess neutralizing solution can be poured into the next prepolymer drum to be neutralized. After 24 hours the drum can be sold to a local drum reclamation company or crushed and sold to a local scrap yard. If it has been crushed it can also be sent to a landfill. DISPOSAL SHOULD BE DONE ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS.

2. **To eliminate excess TyrFil in drums after a drum change, the following procedure should be followed: (THIS PROCEDURE SHOULD NOT BE DONE ON EMPTY DRUMS THAT HAVE BEEN LEFT STANDING UNSEALED FOR LONGER THAN ONE DAY.)**

   Materials needed:

   1 wall rack (similar to drawing)

   2 extra sets of drum valves

   2 extra sets of drum vents

   2 clear hoses with couplers

   Prepare for your next drum change. Install one of the extra sets of drum valves and drum vents in the next kit of TyrFil to be used. Install the wall rack.

   When you are ready to change drums follow the normal procedure except do not change the drum valves or drum vents. The drums you take off the pump should be put in place under the wall racks.

   The drums you remove from the pump should now be placed in the wall rack. When they are in the rack connect the hoses to both the drums in the rack and the drums in place under the rack. Open all valves and allow drums in the rack to drain completely into the standing drums. These drums can be left standing and sealed until your next drum change.

   When the drums in the rack have been completely drained, remove making sure that you have closed all valves. Install the drum valves and drum vents into the kit of TyrFil ready for the next drum change. The empty catalyst drum can now be sold to a local drum reclamation company or crushed and sold to a scrap yard. If the drum is crushed it can be taken to a landfill. ANY OF THESE SUGGESTED WAYS OF DISPOSAL SHOULD BE DONE ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS. The prepolymer drum must be neutralized before disposal. We suggest that a quantity of this neutralizer be kept on hand in case of an emergency. Synair recommends a neutralizing solution consisting of 90% water, 2%

detergent and 8% concentrated ammonia. The detergent can be the brand Ivory or any other dishwashing detergent. The ammonia can be a brand such as Parson's. This solution should be poured into the prepolymer drum and the drum rotated so that all sides are coated. (DO NOT SEAL THE DRUM AFTER POURING NEUTRALIZER INTO IT. THIS NEUTRALIZER GENERATES CARBON DIOXIDE GAS AND IF ENCLOSED COULD BURST THE DRUM.) BE SURE TO DO THIS IN AN AREA PROVIDING ADEQUATE VENTILATION. Let the drum stand for 24 hours to complete the neutralizing process. Any excess neutralizer can be poured into the next prepolymer drum. This drum can now be sold to a local drum reclamation company or crushed and sold to a scrap yard. If the drum is crushed it can also be taken to a landfill. ANY OF THESE SUGGESTED WAYS OF DISPOSAL SHOULD BE DONE ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS.

Drums may be disposed on a regular basis through this procedure. The drums that are being used as drainage receptacles should be used, on the pump, once a month and the process repeated. THIS PROCEDURE IS NOT RECOMMENDED FOR DRUMS THAT HAVE BEEN LEFT STANDING UNSEALED FOR LONGER THAN ONE DAY.

MATERIAL SAFETY DATA SHEET

SECTION I

Manufacturer's Name SYNAIR CORPORATION Emergency Phone No. (615) 698-8801

Address (No., Street, City, State, Zip) 2003 Amnicola Highway, Chattanooga, TN 37406

Chemical Name Isocyanate terminated Prepolymer	Product/Trade Name TyrFil GS
Chemical Family Polyurethane	Component Side B

Information Furnished By: Al Deliman (Name) V.P., Cust. Serv. (Title) 12/3/87 (Date) 2 (Rev. No.)

SECTION II. HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	OSHA PEL	ACGIH TLV	IARC, NTP, OTHER LISTING	%
Toluene diisocyanate	91-08-7	0.02 PPM	0.005 PPM	Yes, NTP	3-5
Isocyanate terminated prepolymer					
Petroleum hydrocarbon	NA	NA	*	Yes, IARC	NA

*Where a mist may be generated, observe 5mg/m^3 for mineral oil mist.

SECTION III. PHYSICAL DATA

Boiling Point (°F.) >350	Specific Gravity (H_2O = 1) 1.016
Vapor Pressure (mm Hg.) NA	Percent Volatile By Volume (%) negligible
Vapor Density (Air = 1) >1	Evaporation Rate (Ether = 1) <1
Solubility in Water reacts	Volatility @ 75°F. very low
Appearance and Odor brown liquid, slight characteristic odor	

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used)	Flammable Limits	Lel	Uel
360°F C.O.C.		NA	NA

Extinguishing Media
Foam, water fog, carbon dioxide or dry chemical

Special Fire Fighting Procedures Wear self-contained breathing apparatus to guard against incompletely combusted carbon products.

Unusual Fire and Explosion Hazards Avoid water contamination in closed containers (exothermic reaction releases carbon dioxide)

NE = Not Established NA = Not Applicable

SECTION V. REACTIVITY DATA

Stability	Unstable		Conditions to Avoid- Moisture contamination will release carbon dioxide leading to pressure buildup in closed containers.
	Stable	XXX	

Incompatability (Materials to Avoid) Water, strong bases, oxidizers, alcohols, amines and other materials which react with isocyanates.

Hazardous Decomposition or Byproducts High temperature and burning conditions may release TDI vapors, cyanates, hydrocarbons, oxides of carbon and nitrogen and traces of HCN.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XXX	If heated above 160°F for extended periods, polymerization may occur but does not constitute a safety hazard.

SECTION VI. HEALTH HAZARD DATA

Primary Route(s) of Entry	Inhalation	Skin	Ingestion
	Yes	Yes	Yes

Carcinogenicity	NTP	IARC	OSHA
	Yes for TDI	Yes for petroleum hydrocarbons	

Signs and Symptoms of Exposure
Harmful if swallowed or inhaled, causes irritation. Inhalation of vapors can cause irritation of the respiratory tract. Contact may cause irritation of the skin. See precautions for handling and storage below.

Health Hazards (Acute and Chronic)
Repeated inhalation of vapors causes immediate or delayed respiratory sensitization leading to asthma-like conditions and difficulty in breathing. Repeated skin contact may produce sensitivity (rash, itching) and under extreme conditions skin cancer. In an NTP study, TDI (A component) was carcinogenic when given orally to rats and mice at maximum tolerated doses. TDI was not carcinogenic to rats in a two-year inhalation study.

Emergency and First Aid Procedures
SKIN: Remove contaminated clothing, wipe affected area with isopropyl alcohol, followed by soap and water. EYES: Flush with water for at least fifteen (15) minutes and consult a physician. INHALATION: Remove person to fresh air. INGESTION: Give large amounts of water and consult a physician.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material is Released or Spilled -Wear protective equipment. Ventilate area, cover liquid with an absorbent material (sawdust, vermiculite, wet sand) or isocyanate neutralizer. Place in open container and treat with decontamination solution (90% water, 8% ammonia, 2% detergent). Leave open in a ventilated area for 24 hours.

Waste Disposal Method BURY OR LAND FILL NEUTRALIZED MATERIAL IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL CONTROL REGULATIONS.

Precautions to Be Taken in Handling and Storing - Store in tightly closed containers in a cool, dry place protected from heat and moisture contamination. Product contains petroleum oils similar to ones categorized by the IARC as causing skin cancer in mice after prolonged, repeated contact. Any potential hazard can be minimized by using recommended protective equipment.

SECTION VIII. CONTROL MEASURES

Respiratory Protection (Specify Type)- None at normal temperature. Self-contained breathing apparatus for high concentrations and under emergency conditions.

Ventilation	Local Exhaust As needed to meet TLV limits.
	Mechanical (General) Recommended.

Protective Gloves Impermeable.	Eye Protection Goggles suitable for liquid handling.

Other Protective Clothing or Equipment
Apron or suitable clothing to avoid skin contact.

Work/Hygienic Practices
Wash thoroughly after handling, before eating, smoking, etc.

MATERIAL SAFETY DATA SHEET

SECTION I

Manufacturer's Name SYNAIR CORPORATION Emergency Phone No. (615) 698-8801

Address (No., Street, City, State, Zip) 2003 Amnicola Highway, Chattanooga, TN 37406

Chemical Name Isocyanate terminated Prepolymer	Product/Trade Name TyrFil LP
Chemical Family Polyurethane	Component Side B

Information Furnished By: Al Deliman (Name) V.P., Cust. Serv. (Title) 12/10/87 (Date) 2. (Rev. No.)

SECTION II. HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	OSHA PEL	ACGIH TLV	IARC, NTP, OTHER LISTING	%
Toluene diisocyanate	91-08-7	0.02 PPM	0.005 PPM	Yes, NTP	3-5
Isocyanate terminated prepolymer					
Petroleum hydrocarbon	NA	NA	*	Yes, IARC	NA

*Where a mist may be generated, observe 5mg/m^3 for mineral oil mist.

SECTION III. PHYSICAL DATA

Boiling Point (°F.) >350	Specific Gravity (H_2O = 1) 1.015
Vapor Pressure (mm Hg.) NA	Percent Volatile By Volume (%) negligible
Vapor Density (Air = 1) >1	Evaporation Rate (Ether = 1) <1
Solubility in Water reacts	Volatility @ 75°F. very low
Appearance and Odor brown liquid, slight characteristic odor	

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) 360°F C.O.C.	Flammable Limits	Lel NA	Uel NA

Extinguishing Media
Foam, water fog, carbon dioxide or dry chemical

Special Fire Fighting Procedures Wear self-contained breathing apparatus to guard against incompletely combusted carbon products.

Unusual Fire and Explosion Hazards Avoid water contamination in closed containers (exothermic reaction releases carbon dioxide)

= Not Established NA = Not Applicable

SECTION V. REACTIVITY DATA

Stability	Unstable		Conditions to Avoid- Moisture contamination will release
	Stable	XXX	carbon dioxide leading to pressure buildup in closed containe

Incompatability (Materials to Avoid) Water, strong bases, oxidizers, alcohols, amines and other materials which react with isocyanates.

Hazardous Decomposition or Byproducts High temperature and burning conditions may release TDI vapors, cyanates, hydrocarbons, oxides of carbon and nitrogen and traces of HCN.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XXX	If heated above 160°F for extended periods, polymerization may occur but does not constitute a safety hazard.

SECTION VI. HEALTH HAZARD DATA

Primary Route(s) of Entry	Inhalation	Skin	Ingestion
	Yes	Yes	Yes
Carcinogenicity	NTP	IARC	OSHA
	Yes for TDI	Yes for petroleum hydrocarbons	

Signs and Symptoms of Exposure
Harmful if swallowed or inhaled, causes irritation. Inhalation of vapors can cause irritation of the respiratory tract. Contact may cause irritation of the skin. See precautions for handling and storage below.

Health Hazards (Acute and Chronic)
Repeated inhalation of vapors causes immediate or delayed respiratory sensitization leading to asthma-like conditions and difficulty in breathing. Repeated skin contact may produce sensitivity (rash, itching) and under extreme conditions skin cancer. In an NTP study, TDI (A component) was carcinogenic when given orally to rats and mice at maximum tolerated doses. TDI was not carcinogenic to rats in a two-year inhalation study.

Emergency and First Aid Procedures
SKIN: Remove contaminated clothing, wipe affected area with isopropyl alcohol, followed by soap and water. EYES: Flush with water for at least fifteen (15) minutes and consult a physician. INHALATION: Remove person to fresh air. INGESTION: Give large amounts of water and consult a physician.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material is Released or Spilled -Wear protective equipment. Ventilate area, cover liquid with an absorbent material (sawdust, vermiculite, wet sand) or isocyanate neutralizer. Place in open container and treat with decontamination solution (90% water, 8% ammonia, 2% detergent). Leave open in a ventilated area for 24 hours.

Waste Disposal Method BURY OR LAND FILL NEUTRALIZED MATERIAL IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL CONTROL REGULATIONS.

Precautions to Be Taken in Handling and Storing - Store in tightly closed containers in a cool, dry place protected from heat and moisture contamination. Product contains petroleum oils similar to ones categorized by the IARC as causing skin cancer in mice after prolonged, repeated contact. Any potential hazard can be minimized by using recommended protective equipment.

SECTION VIII. CONTROL MEASURES

Respiratory Protection (Specify Type)- None at normal temperature. Self-contained breathing apparatus for high concentrations and under emergency conditions.

Ventilation	Local Exhaust As needed to meet TLV limits.
	Mechanical (General) Recommended.

Protective Gloves Impermeable.	Eye Protection Goggles suitable for liquid handling.

Other Protective Clothing or Equipment
Apron or suitable clothing to avoid skin contact.

Work/Hygienic Practices
Wash thoroughly after handling, before eating, smoking, etc.

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

PRODUCT NAME: VORANATE (R) T-80 TYPE II TOLUENE DIISOCYANATE

Effective Date: 12/13/88 Date Printed: 05/03/89 MSD: 000609

1. INGREDIENTS: (% w/w, unless otherwise noted)

Toluene-2,4-diisocyanate (TDI)	CAS# 000584-84-9	80%
Toluene-2,6-diisocyanate	CAS# 000091-08-7	20%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: 250C (482F)
VAP PRESS: 0.01 mmHg @ 20C
VAP DENSITY: 6.0
SOL. IN WATER: Insoluble
SP. GRAVITY: 1.22 @ 25/15.5C
APPEARANCE: Water white to pale yellow liquid.
ODOR: Sharp pungent odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 127C (260F)
METHOD USED: PMCC, ASTM D-93

FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, or foam. If water is used, it should be in very large quantity. The reaction between water and hot isocyanate may be vigorous.

FIRE & EXPLOSION HAZARDS: Down-wind personnel must be evacuated. Do not reseal contaminated containers since pressure build-up may cause rupture. Fire point: 146C (295F).

FIRE-FIGHTING EQUIPMENT: People who are fighting isocyanate fires must be protected against nitrogen oxide fumes and isocyanate vapors by wearing positive pressure self-contained breathing

(Continued on Page 2)

* An Operating Unit Of The Dow Chemical Company

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

apparatus and full protective clothing.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable when stored under recommended storage conditions. Store in a dry place at temperatures between 18-41C (65-105F).

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Water, acid, base, alcohols, metal compounds, surface active materials. Avoid water as it reacts to form heat, CO2 and insoluble urea. The combined effect of the CO2 and heat can produce enough pressure to rupture a closed container.

HAZARDOUS DECOMPOSITION PRODUCTS: Isocyanate vapor and mist, carbon dioxide, carbon monoxide, nitrogen oxides and traces of hydrogen cyanide.

HAZARDOUS POLYMERIZATION: May occur with incompatible reactants, especially strong bases, water or temperatures over 41C (105F).

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS:

Evacuate and ventilate spill area, dike spill to prevent entry into water system, wear full protective equipment including respiratory equipment during clean up.

Major spill: Call Dow Chemical U.S.A. (409) 238-2112. If transportation spill involved call CHEMTREC (800) 424-9300. If temporary control of isocyanate vapor is required a blanket of protein foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed but not sealed containers for disposal.

Minor spill: Absorb the isocyanate with sawdust or other absorbent and shovel into open top containers. Do not make pressure tight. Transport to a well-ventilated area (outside) and treat with neutralizing solution consisting of a mixture of

(Continued on Page 3)

5. ENVIRONMENTAL AND DISPOSAL INFORMATION: (CONTINUED)

water and 3-8% concentrated ammonium hydroxide or 5-10% sodium carbonate. Add about 10 parts of neutralizer per part of isocyanate with mixing. Allow to stand for 48 hours letting evolved carbon dioxide to escape.

Clean-up: Decontaminate floor using water/ammonia solution with 1-2% added detergent letting stand over affected area for at least 10 minutes. Cover mops and brooms used for this with plastic and dispose properly (often by incineration).

DISPOSAL METHOD: Follow all federal, state and local regulations. Liquids are usually incinerated in a proper facility. Solids are usually also incinerated or landfilled. Empty drums should be filled with water. Let drum stand unsealed for 48 hours. Before disposal drums should be drained, triple rinsed, and holed to prevent reuse. Dispose of drain and rinse fluid according to federal, state and local laws and regulations. The most commonly accepted method is in an approved wastewater treatment facility. Drums should be disposed of in accordance with federal, state and local laws and regulations. Commonly accepted methods for disposal of plastic drums are disposal in an approved landfill after shredding or incineration in an approved industrial incinerator or other appropriate incinerator facility. Steel drums are commonly disposed in an approved landfill after crushing or in accordance with other approved procedures.

6. HEALTH HAZARD DATA:

EYE: May cause pain, severe eye irritation and moderate corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause severe irritation, even a burn. Skin contact may result in allergic reaction even though it is not expected to result in absorption of amounts sufficient to cause other adverse effects.

SKIN ABSORPTION: The LD50 for skin absorption in rabbits is >9400 mg/kg.

(Continued on Page 4)

6. HEALTH HAZARD DATA: (CONTINUED)

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is 5800 mg/kg. Ingestion may cause gastrointestinal irritation or ulceration.

INHALATION: Excessive vapor concentrations are attainable and could be hazardous on single exposure. Single and repeated excessive exposure may cause severe irritation to upper respiratory tract and lungs (choking sensation, chest tightness), respiratory sensitization, decreased ventilatory capacity, liver effects, cholinesterase depression, gastro-intestinal distress and/or neurologic disorders. The 4-hour LC50 for TDI for rats is 13.9 ppm.

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any additional significant adverse effects. For hazard communication purposes under OSHA standard 29 CFR Part 1910.1200, this chemical is listed as a potential carcinogen by Nat'l. Tox. Program and IARC. An oral study in which high doses of TDI were reported to cause cancer in animals has been found to contain numerous deficiencies which compromise the validity of the study. TDI did not cause cancer in laboratory animals exposed by inhalation, the most likely route of exposure. Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother. Results of in vitro ("test tube") mutagenicity tests have been inconclusive.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician if irritation persists. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: Do not induce vomiting. Call a physician and/or

(Continued on Page 5)

7. FIRST AID: (CONTINUED)

transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: May cause tissue destruction leading to stricture. If lavage is performed, suggest endotracheal and/or esophagoscopic control. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. The manifestations of the respiratory symptoms, including pulmonary edema, resulting from acute exposure may be delayed. May cause respiratory sensitization. Cholinesterase inhibition has been noted in human exposure but is not of benefit in determining exposure and is not correlated with signs of exposure.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): OSHA PEL is 0.02 ppm as a ceiling limit for toluene 2,4-diisocyanate. ACGIH TLV is 0.005 ppm; 0.02 ppm STEL for toluene 2,4-diisocyanate. Dow Industrial Hygiene Guide is 0.02 ppm as a ceiling limit for toluene diisocyanate.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved supplied-air respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Safety shower should

(Continued on Page 6)

8. HANDLING PRECAUTIONS: (CONTINUED)

be located in immediate work area.

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye irritation, use a full-face, supplied-air respirator. Eye wash fountain should be located in immediate work area.

9. ADDITIONAL INFORMATION:

REGULATORY REQUIREMENTS:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A reactive hazard

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Warning properties of this material (irritation of eyes, nose and throat) not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposure to lower concentrations. Exposures to vapors of heated TDI can be extremely dangerous. (Have TDI neutralizer available for spills.)

MSDS STATUS: Revised Section 9

SARA 313 INFORMATION:
This product contains the following substances subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

(Continued on Page 7)

9. ADDITIONAL INFORMATION: (CONTINUED)

CHEMICAL NAME	CAS NUMBER	CONCENTRATION	
TOLUENE-2,6-DIISOCYANATE	000091-08-7	20	%
TOLUENE-2,4-DIISOCYANATE	000584-84-9	80	%

MATERIAL SAFETY DATA SHEET

DOW CHEMICAL U.S.A. MIDLAND, MI 48674 EMERGENCY PHONE: 517-636-4400

PRODUCT CODE: 92100 PAGE: 1

PRODUCT NAME: VORANATE (R) T-7000 ISOCYANATE

EFFECTIVE DATE: 08/04/86 DATE PRINTED: 09/25/86 MSD: 000838

1. INGREDIENTS:

PROPRIETARY TOLUENE DIISOCYANATE PREPOLYMER BLEND
ABOUT 30% UNREACTED TOLUENE DIISOCYANATE CAS# 026471-62-5

SUBSTANCES LISTED IN THE INGREDIENTS SECTION ARE THOSE IDENTIFIED AS BEING PRESENT AT A CONCENTRATION OF 1% OR GREATER, OR 0.1% IF THE SUBSTANCE IS ON THE LIST OF POTENTIAL CARCINOGENS CITED IN OSHA HAZARD COMMUNICATION STANDARD. WHERE PROPRIETARY INGREDIENT SHOWS, THE IDENTITY OF THIS SUBSTANCE MAY BE MADE AVAILABLE AS PROVIDED IN 29 CFR 1910.1200(I).

2. PHYSICAL DATA:

BOILING POINT: >482F (250C)
VAP PRESS: 0.01 MMHG @ 20C
VAP DENSITY: 6.0 (TDI)
SOL. IN WATER: < 100 PPM @ 25C
SP. GRAVITY: 1.25 @ 25/25C
APPEARANCE: COLORLESS LIQUID.
ODOR: VERY SHARP AND PUNGENT.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 270F, 132C
METHOD USED: PMCC, ASTM D-93

FLAMMABLE LIMITS
LFL: NOT DETERMINED
UFL: NOT DETERMINED

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY CHEMICAL, FOAM, HALON 1211. IF WATER IS USED, IT SHOULD BE IN VERY LARGE QUANTITY. THE REACTION BETWEEN WATER AND HOT ISOCYANATE MAY BE VIGOROUS.

FIRE AND EXPLOSION HAZARDS: DOWN-WIND PERSONNEL MUST BE EVACUATED. DO NOT RESEAL CONTAMINATED CONTAINERS SINCE PRESSURE BUILD-UP MAY CAUSE RUPTURE.

FIRE-FIGHTING EQUIPMENT: PEOPLE WHO ARE FIGHTING ISOCYANATE FIRES MUST BE PROTECTED AGAINST NITROGEN OXIDE FUMES AND ISOCYANATE VAPORS BY WEARING POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) STABLE WHEN STORED UNDER

(CONTINUED ON PAGE 2)

4. REACTIVITY DATA: (CONTINUED)

RECOMMENDED STORAGE CONDITIONS. STORE IN A DRY PLACE AT TEMPERATURES BETWEEN 15-38C (60-100F).

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) WATER, ACID, BASE, ALCOHOLS, METAL COMPOUNDS, SURFACE ACTIVE MATERIALS. AVOID WATER AS IT REACTS TO FORM HEAT, CO2 AND INSOLUBLE UREA. THE COMBINED EFFECT OF THE CO2 AND HEAT CAN PRODUCE ENOUGH PRESSURE TO RUPTURE A CLOSED CONTAINER.

HAZARDOUS DECOMPOSITION PRODUCTS: ISOCYANATE VAPOR AND MIST, CARBON DIOXIDE, CARBON MONOXIDE, NITROGEN OXIDES AND TRACES OF HYDROGEN CYANIDE.

HAZARDOUS POLYMERIZATION: MAY OCCUR WITH INCOMPATIBLE REACTANTS, ESPECIALLY STRONG BASES, WATER OR TEMPERATURES OVER 49C (120F).

ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: EVACUATE AND VENTILATE SPILL AREA, DIKE SPILL TO PREVENT ENTRY INTO WATER SYSTEM, WEAR FULL PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN UP.
MAJOR SPILL: CALL DOW CHEMICAL U.S.A. (409) 238-2112. IF TRANSPORTATION SPILL INVOLVED CALL CHEMTREC (800) 424-9300. IF TEMPORARY CONTROL OF ISOCYANATE VAPOR IS REQUIRED A BLANKET OF PROTEIN FOAM (AVAILABLE AT MOST FIRE DEPARTMENTS) MAY BE PLACED OVER THE SPILL. LARGE QUANTITIES MAY BE PUMPED INTO CLOSED BUT NOT SEALED CONTAINERS FOR DISPOSAL.
MINOR SPILL: ABSORB THE ISOCYANATE WITH SAWDUST OR OTHER ABSORBENT, SHOVEL INTO SUITABLE UNSEALED CONTAINERS, TRANSPORT TO WELL-VENTILATED AREA (OUTSIDE) AND TREAT WITH NEUTRALIZING SOLUTION CONSISTING OF A MIXTURE OF WATER AND 3-8% CONCENTRATED AMMONIUM HYDROXIDE (OR 5-10% SODIUM CARBONATE). ADD ABOUT 10 PARTS OF NEUTRALIZER PER PART OF ISOCYANATE WITH MIXING. ALLOW TO STAND FOR 48 HOURS LETTING EVOLVED CO2 ESCAPE.

CLEAN-UP: DECONTAMINATE FLOOR USING WATER/AMMONIA SOLUTION WITH 1-2% ADDED DETERGENT LETTING STAND OVER AFFECTED AREA FOR AT LEAST 10 MINUTES. COVER MOPS AND BROOMS USED FOR THIS WITH PLASTIC AND DISPOSE PROPERLY (OFTEN BY INCINERATION).

DISPOSAL METHOD: FOLLOW ALL FEDERAL, STATE AND LOCAL REGULATIONS. LIQUIDS ARE USUALLY INCINERATED IN A PROPER FACILITY. SOLIDS ARE USUALLY ALSO INCINERATED OR LANDFILLED. EMPTY DRUMS SHOULD BE FILLED WITH WATER; LET STAND FOR AT LEAST 48 HOURS; DRUMS

(CONTINUED ON PAGE 3)

5. ENVIRONMENTAL AND DISPOSAL INFORMATION: (CONTINUED)

SHOULD BE DRAINED, TRIPLE RINSED, AND HOLED OR CRUSHED TO PREVENT REUSE. DISPOSE OF DRAIN AND RINSE FLUID ACCORDING TO LOCAL, STATE, AND FEDERAL REGULATIONS.

6. HEALTH HAZARD DATA:

EYE: MAY CAUSE PAIN, SEVERE EYE IRRITATION AND SLIGHT CORNEAL INJURY. IN ANIMALS, IRRITATION AND CORNEAL INJURY HEALED WITHIN 14 DAYS.

SKIN CONTACT: IS LIKELY TO CAUSE AN ALLERGIC SKIN REACTION. PROLONGED OR REPEATED EXPOSURE MAY CAUSE SKIN IRRITATION.

SKIN ABSORPTION: A SINGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN THE MATERIAL BEING ABSORBED THROUGH SKIN IN HARMFUL AMOUNTS. THE DERMAL LD50 HAS NOT BEEN DETERMINED.

INGESTION: SINGLE DOSE ORAL TOXICITY IS LOW. THE ORAL LD50 FOR RATS IS >4000 MG/KG. INGESTION MAY CAUSE GASTROINTESTINAL IRRITATION OR ULCERATION.

INHALATION: EXCESSIVE VAPOR CONCENTRATIONS ARE ATTAINABLE AND COULD BE HAZARDOUS ON SINGLE EXPOSURE. SINGLE AND REPEATED EXCESSIVE EXPOSURE MAY CAUSE SEVERE IRRITATION TO UPPER RESPIRATORY TRACT AND LUNGS (CHOKING SENSATION, CHEST TIGHTNESS), RESPIRATORY SENSITIZATION, DECREASED VENTILATORY CAPACITY, LIVER EFFECTS, CHOLINESTERASE DEPRESSION, GASTRO-INTESTINAL DISTRESS AND/OR NEUROLOGIC DISORDERS. THE 4-HOUR LC50 FOR TDI FOR RATS IS 13.9 PPM.

SYSTEMIC & OTHER EFFECTS: AN ORAL STUDY IN WHICH HIGH DOSES OF TDI WERE REPORTED TO CAUSE CANCER IN ANIMALS HAS BEEN FOUND TO CONTAIN NUMEROUS DEFICIENCIES WHICH COMPROMISE THE VALIDITY OF THE STUDY. TDI DID NOT CAUSE CANCER IN LABORATORY ANIMALS EXPOSED BY INHALATION, THE MOST LIKELY ROUTE OF EXPOSURE. RESULTS OF IN VITRO ("TEST TUBE") MUTAGENICITY TESTS HAVE BEEN INCONCLUSIVE.

7. FIRST AID:

EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR 15 MINUTES. CONSULT MEDICAL PERSONNEL.

SKIN: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED

(CONTINUED ON PAGE 4)

7. FIRST AID: (CONTINUED)

CLOTHING AND SHOES. CALL A PHYSICIAN IF IRRITATION PERSISTS. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

INGESTION: DO NOT INDUCE VOMITING. CALL A PHYSICIAN AND/OR TRANSPORT TO EMERGENCY FACILITY IMMEDIATELY.

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

NOTE TO PHYSICIAN: CORROSIVE. MAY CAUSE STRICTURE. IF LAVAGE IS PERFORMED, SUGGEST ENDOTRACHEAL AND/OR ESOPHAGOSCOPIC CONTROL. IF BURN IS PRESENT, TREAT AS ANY THERMAL BURN, AFTER DECONTAMINATION. NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE. TREATMENT BASED ON JUDGMENT OF THE PHYSICIAN IN RESPONSE TO REACTIONS OF THE PATIENT. THE MANIFESTATIONS OF THE RESPIRATORY SYMPTOMS, INCLUDING PULMONARY EDEMA, RESULTING FROM ACUTE EXPOSURE MAY BE DELAYED. MAY CAUSE RESPIRATORY SENSITIZATION. CHOLINESTERASE INHIBITION HAS NOT BEEN NOTED IN HUMAN EXPOSURE AND IS NOT OF BENEFIT IN DETERMINING EXPOSURE.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): OSHA PEL IS 0.02 PPM AS A CEILING LIMIT FOR TOLUENE 2,4-DIISOCYANATE. ACGIH TLV IS 0.005 PPM; 0.02 PPM STEL FOR TOLUENE 2,4-DIISOCYANATE. DOW INDUSTRIAL HYGIENE GUIDE IS 0.02 PPM AS A CEILING LIMIT FOR TOLUENE DIISOCYANATE.

VENTILATION: PROVIDE GENERAL AND/OR LOCAL EXHAUST VENTILATION TO CONTROL AIRBORNE LEVELS BELOW THE EXPOSURE GUIDELINES.

RESPIRATORY PROTECTION: ATMOSPHERIC LEVELS SHOULD BE MAINTAINED BELOW THE EXPOSURE GUIDELINE. WHEN RESPIRATORY PROTECTION IS REQUIRED FOR CERTAIN OPERATIONS, USE AN APPROVED SUPPLIED-AIR RESPIRATOR. FOR EMERGENCY AND OTHER CONDITIONS WHERE THE EXPOSURE GUIDELINE MAY BE GREATLY EXCEEDED, USE AN APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS.

SKIN PROTECTION: USE PROTECTIVE CLOTHING IMPERVIOUS TO THIS MATERIAL. SELECTION OF SPECIFIC ITEMS SUCH AS GLOVES, BOOTS, APRON, OR FULL-BODY SUIT WILL DEPEND ON OPERATION. REMOVE CONTAMINATED CLOTHING IMMEDIATELY, WASH SKIN AREA WITH SOAP AND WATER, AND LAUNDER CLOTHING BEFORE REUSE. SAFETY SHOWER SHOULD BE LOCATED IN IMMEDIATE WORK AREA.

(CONTINUED ON PAGE 5)

8. HANDLING PRECAUTIONS: (CONTINUED)

EYE PROTECTION: USE CHEMICAL GOGGLES. IF VAPOR EXPOSURE CAUSES EYE IRRITATION, USE A FULL-FACE, SUPPLIED-AIR RESPIRATOR. EYE WASH FOUNTAIN SHOULD BE LOCATED IN IMMEDIATE WORK AREA.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: PREVENT ALL CONTACT. STORE AT 40C (104F) OR LOWER; DO NOT EXCEED 50C (122F). OPEN DRUMS WITH CAUTION; CONTENTS MAY BE UNDER PRESSURE. PREVENT ALL CONTACT; WARNING PROPERTIES OF THIS MATERIAL (IRRITATION OF EYES, NOSE, AND THROAT) ARE NOT ADEQUATE TO PREVENT CHRONIC OVEREXPOSURE FROM INHALATION. THIS MATERIAL CAN PRODUCE ASTHMATIC SENSITIZATION UPON EITHER SINGLE INHALATION EXPOSURE TO A RELATIVELY HIGH CONCENTRATION OR UPON REPEATED INHALATION EXPOSURE TO LOWER CONCENTRATIONS. EXPOSURES TO VAPORS OF HEATED TDI CAN BE EXTREMELY DANGEROUS.

MSDS STATUS: REVISED 6 AND 7.

B12741539W

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Post Office ZIP Code 37343	Time In: 1353 A.M. P.M.	Return Receipt Fee $ FC
Initials of Receiving Clerk JH	Weight ___ lbs. ___ oz.	

ACCEPTANCE

- [x] Accepted for next day delivery.
- [ ] Accepted for this destination after deposit deadline for next day delivery therefore, for delivery by second day.
- [ ] International On Demand: Country Code ___ ___

Total Postage & Fees $ 12.90

For Customer Use

Express Mail Corporate Account No.:

Federal Agency Control No.:

FROM: Dr. Ahmed Zurkiya
Synair Corporation
P.O. Box 5269
Chattanooga, TN 37406-0269

ADDRESSEE'S COPY

DESTINATION	Date of Delivery 7/3/89	Time of Delivery 815 A.M. P.M.
X Signature of Addressee or Agent		
DELIVERY WAS ATTEMPTED	Date:	Time: A.M. P.M.
Signature of Delivery Employee	1. M. Nelson	2.

WAIVER OF SIGNATURE

I wish delivery to be made without obtaining the signature of the addressee or the addressee's agent and I authorize the delivery employee to sign that the shipment was delivered and understand that the signature of the delivery employee will constitute valid proof of delivery.

SIGNED: _____

TO: Telephone Number: _____
Document Processing Center
Office of Toxic Substances TS-790
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460
ATTN: CAIR Reporting Office

Label 11-F (JULY 1987)